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(21) International Application Number: PCT/US88/03105 (22) International Filing Date: 8 September 1988 (08.09.88) (31) Priority Application Number: 093,616 (32) Priority Date: 8 September 1987 (08.09.87) (33) Priority Country: US (71) Applicant: SNACKRITE, INC. [US/US]; 4250 Wilshire Boulevard, Suite 301, Los Angeles, CA 90010 (US). (72) Inventor: GARRISON, Robert, H., Jr. ; 424 Stratford Court, Delmar, CA 92014 (US). (74) Agent: WRAY, James, C.; 1493 Chain Bridge Road, Suite 300, McLean, VA 22101 (US).		(81) Designated States: AT (European patent), AU, BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB (European patent), IT (European patent), JP, KR, LU (European patent), NL (European patent), SE (European patent). Published <i>With international search report.</i>
(54) Title: SNACK CRACKER. (57) Abstract Small snack items have a blend of soluble fibers that lower cholesterol levels and body weight. The uniqueness of the blend of oat and guar fibers is responsible for the cholesterol reduction.		

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SNACK CRACKER

Background of the Invention

Heart disease causes more deaths of both men and women than all cancer combined. And a major risk factor of heart disease is high cholesterol in the blood. Another factor is excess weight.

High blood cholesterol can be lowered by changes in diet. One should reduce fat and cholesterol in a diet and eat more fish and poultry and low-cholesterol, low-fat foods, such as vegetables, fruits and whole grains.

There are many high fiber products on the market, including crackers such as Wasa or Norwegian Crisp Bread. But these products do not contain the fibers of the present invention. The present invention is useful in problems of excess weight, hypercholesterolemia and diabetes.

Recent medical studies have shown that a fat-modified, low-cholesterol diet and increased soluble oat fiber can reduce the level of blood cholesterol in adults. Lowering high blood cholesterol may help reduce the risk of a heart attack.

Oat bran has beneficial effects because it contains a large percentage of water-soluble fiber termed gum. There is more gum in oat bran than in oatmeal, and oat bran is better. Guar gum is also useful. Guar gum makes thick and heavy soups and stews. Guar gum has been known to lower serum cholesterol by an average of 16.6 percent. Soluble fibers, such as oat bran and guar gum affect glucose metabolism and insulin requirements.

One of the difficulties of ingesting sufficient quantities of oat bran and guar gum is that they tend to be unpalatable or to produce sticky gummy masses. Soups and

stews which use guar gum as thickeners tend to be too thick and rubbery or gummy. Ingesting unhydrolized guar gum should be avoided.

Soluble fibers or gums need to be ingested regularly in small but sufficient quantities.

Summary of the Invention

The present invention avoids problems inherent in the prior art and produces easily ingestible foods with sufficient but not excessive soluble fibers to reduce plaque and serum cholesterol on a regular basis.

The invention provides small snack items that have a blend of soluble fibers that lower cholesterol levels and body weight. The uniqueness of the blend of oat and guar fibers is responsible for the cholesterol reduction. A preferred product has a ratio of oat bran to guar gum of about 2 to 1. The oat bran and guar gum combined are about 20 to 30 percent of the product weight. The preferred product has about 2 to 4 percent water.

This invention has created a blend of two soluble fibers, oat and guar, and has incorporated this combination into a cracker.

This invention provides a food product containing flour, water, oat bran, guar gum. The product is blended into a dough, hydrated, rolled, separated, and baked to a crisp cracker-like consistency. The product is useful for the palatable human ingestion of sufficient soluble fiber and gum to be effective in reducing serum cholesterol, low density lipids and body weight in humans.

The flour is present in a range of 32 to 49, preferably 33, percent by weight of the blended ingredients before baking.

In the preferred product, the flour is present in a range of 32.6 to 48.3, preferably 32.9, percent by weight of the blended ingredients before baking.

The oat bran is present in a range of 6 to 12, preferably 10, percent by weight of the blended ingredients before baking.

In the preferred product the oat bran is present in a range of 6.0 to 11.2, preferably 9.5, percent by weight of the blended ingredients before baking.

The guar gum is present in a range of 2 to 6, preferably 5, percent by weight of the blended ingredients before baking.

In a preferred product the guar gum is present in a range of 2.5 to 6.0, preferably 5.0, percent by weight of the blended ingredients before baking.

Before baking the water is present in a range of 33.8 to 49.3 preferably 48.3 percent by weight of the blended ingredients. The dough may be rolled to about $1/32$ to $3/32$, preferably $3/64$, inch in thickness.

The invention provides a solid palatable food product for mastication, ingestion, digestion, assimilation and elimination to reduce vascular cholesterol, low density lipids and body mass in humans comprising oat bran and guar gum in a ratio of about two parts by weight oat bran to one part guar gum in combination with sufficient liquid and flour to make a moldable, bakable product.

This invention provides a unique snack cracker, or more accurately, a blend of soluble fibers, such as contained in the snack cracker.

This product is targeted toward two purposes: weight loss and reduction of elevated cholesterol levels.

The invention provides a particular blend of oat bran and guar gum and the product made therefrom. This blend of oat guar may be incorporated into a series of snack products. These are the special ingredients responsible for weight loss and cholesterol-lowering properties.

Description of the Preferred Embodiments

In one preferred form of the invention, soluble fibers or gum are incorporated in palatable snack crackers. The ingredients of dough, the ranges which have been used during the experimental development and the preferred embodiment of the formula are as follows:

Ingredient	Range of Percentages	Preferred Percentage
Wheat Flour	32.6 - 48.3	32.9
Oat Bran	6.0 - 11.2	9.5
Guar Gum	2.5 - 6.0	5.0
Granulated Sugar	0.0 - 2.0	1.8
HiFructose corn syrup	0.0 - 1.1	1.0
Vegetable oil	0.0 - 5.0	1.0
Baking powder	0.0 - 1.0	0.0
Ammonium Carbonate	0.0 - 0.5	0.5
Salt	0.0 - 0.5	0.0
Dimethyl poly-siloxane	0.0 - 0.02	0.02.
Water	33.8 - 49.3	48.28

To make the dough, the dry ingredients - wheat flour, (preferably from a soft wheat and commonly called cracker flour), oat bran, guar gum, and sugar - are placed in a mixer bowl and blended briefly. Then the vegetable oil, dimethyl polysiloxane (DMP) and high fructose corn syrup are added. The ammonium carbonate (dissolved in ten times its weight of warm water, which water is deducted from the final water addition) is added, followed by the remainder of the dough water. The mixture is mixed on low speed for one (1) minute and on medium speed for two (2) minutes.

The dough is turned out into a trough, covered, and allowed to rest for ten to twenty minutes, to ensure that the ingredients are equably hydrated. The processing of the dough is similar to that normally employed by a manufacturer of snack-type crackers. It is extruded onto a moving belt in such a way that several overlapping layers of dough are formed. The multi-layered sheet is then reduced in thickness by passing it through successive sheeting and gauging rolls, until a suitably thin continuous sheet of dough is obtained. This sheet may be from $1/32$ to $3/32$ inch in thickness, but is preferably $3/64$ inch thick.

Topping salt is applied to the dough sheet if desired (preferably in an amount equal to 0.5% of the total dough weight), the sheet is scored and docked by passing it under suitable rollers (the preferred shape for individual pieces is a square $3/4$ inch on a side, with at least one docking punch in the center) and the sheet is transferred to the band of a tunnel oven which transports it through the various heating/baking zones of the oven. The time and temperature of the bake are adjusted to give a finished snack which is baked but not burnt, and has a moisture content of 2% to 4%, preferably 2.5% to 2.8%.

After exiting from the oven the snack pieces are sprayed with topping oil in an amount equal to 4% to 10% (preferably 6%) of the weight of the pieces, and a suitable topical flavoring is applied. After cooling, the HiFiber Snack product is packed in a suitable packaging medium, i.e., in a bag-in-box or a metallized film bag, which will give it the desired shelf life for retention of consumer acceptance.

One example of a snack cracker formula is as follows:

Ingredient	Grams	% of Dough
Pastry flour	690	32.6
Oat bran	200	9.5
Guar gum	100	4.7
Sugar	36	1.7
Hi fructose corn syrup	20	0.9
Ammonium bicarbonate	9	0.4
F & F cheese	60	2.7
Polysiloxane (Simethicone)	0.4	0.019
Water	1000	47.3
Topping Salt	10	0.5
Brushing oil	80	3.8
Flavors	7.5-12g/150g cracker	

While the invention has been described with reference to specific embodiments, modifications and variations may be made without departing from the scope of the invention, which is defined in the following claims.

That which is claimed is:

1. A food product containing flour, water, oat bran, guar gum blended into a dough, hydrated, rolled, separated, and baked to a crisp cracker-like consistency and useful for the palatable human ingestion of sufficient soluble fiber and gum to be effective in reducing serum cholesterol, low density lipids and body weight in humans.

2. The product of claim 1 wherein the flour is present in a range of 32.6 to 48.3 preferably 32.9 percent by weight of the blended ingredients before baking.

3. The product of claim 1 wherein the flour is present in a range of 32 to 48 preferably 33 percent by weight of the blended ingredients before baking.

4. The product of claim 1 wherein the oat bran is present in a range of 6 to 11 preferably 10 percent by weight of the blended ingredients before baking.

5. The product of claim 1 wherein the oat bran is present in a range of 6.0 to 11.2 preferably 9.5 percent by weight of the blended ingredients before baking.

6. The product of claim 1 wherein the guar gum is present in a range of 3 to 6 preferably 5 percent by weight of the blended ingredients before baking.

7. The product of claim 1 wherein the guar gum is present in a range of 2.5 to 6.0 preferably 5.0 percent by weight of the blended ingredients before baking.

8. The product of claim 1 wherein the water is present in a range of 33.8 to 49.3 preferably 48.3 percent by weight of the blended ingredients before baking.

9. The product of claim 1 wherein the dough is rolled to about 1/32 to 3/32 preferably 3/64 inch in thickness.

10. The product of claim 3 wherein oat bran is

present in about 6 to 11 preferably 10 percent by weight of the blended ingredients before baking.

11. The product of claim 3 wherein the guar gum is present in a range of 3 to 6 preferably 5 percent by weight of the blended ingredients before baking.

12. The product of claim 11 wherein oat bran is present in about 6 to 11 preferably 10 percent by weight of the blended ingredients before baking.

13. The product of claim 12 further comprising in percent by unbaked weight

Ingredient	Range of Percentages	Preferred Percentage
Wheat Flour	32.6 - 48.3	32.9
Oat Bran	6.0 - 11.2	9.5
Guar Gum	2.5 - 6.0	5.0
Granulated Sugar	0.0 - 2.0	1.8
HiFructose corn syrup	0.0 - 1.1	1.0
Vegetable oil	0.0 - 5.0	1.0
Baking powder	0.0 - 1.0	0.0
Ammonium Carbonate	0.0 - 0.5	0.5
Salt	0.0 - 0.5	0.0
Dimethyl poly-siloxane	0.0 - 0.02	0.02.

14. The product of claim 1 further comprising in percent by unbaked weight

Ingredient	Range of Percentages	Preferred Percentage
Wheat Flour	32.6 - 48.3	32.9
Oat Bran	6.0 - 11.2	9.5
Guar Gum	2.5 - 6.0	5.0
Granulated Sugar	0.0 - 2.0	1.8
HiFructose corn syrup	0.0 - 1.1	1.0
Vegetable oil	0.0 - 5.0	1.0
Baking powder	0.0 - 1.0	0.0
Ammonium Carbonate	0.0 - 0.5	0.5
Salt	0.0 - 0.5	0.0
Dimethyl poly-siloxane	0.0 - 0.02	0.02.

15. A solid palatable food product for mastication, ingestion, digestion, assimilation and elimination to reduce vascular cholesterol, low density lipids and body mass in

humans comprising oat bran and guar gum in a ratio of about two parts by weight oat bran to one part guar gum in combination with sufficient liquid and flour to make a moldable, bakable product.

16. The product of claim 15 further comprising in percent by unbaked weight

Ingredient	Range of Percentages	Preferred Percentage
Wheat Flour	32.6 - 48.3	32.9
Oat Bran	6.0 - 11.2	9.5
Guar Gum	2.5 - 6.0	5.0
Granulated Sugar	0.0 - 2.0	1.8
HiFructose corn syrup	0.0 - 1.1	1.0
Vegetable oil	0.0 - 5.0	1.0
Baking powder	0.0 - 1.0	0.0
Ammonium Carbonate	0.0 - 0.5	0.5
Salt	0.0 - 0.5	0.0
Dimethyl poly-siloxane	0.0 - 0.02	0.02.

INTERNATIONAL SEARCH REPORT

International Application No. PCT/US88/03105

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC		
INT. A23L 1/10	A23J 1/12	U.S. 426/804 and 808
Cl. A23L 1/04		Cl. 514/777 and 909
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
U.S.	426/804 and 808 514/777 and 909	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category [*]	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
X	US, A, 4,496,606 (Michnowski) 29 January 1985 (Abstract and columns 1-8)	1-16
X	US, A, 4,497,840 (Gould et al) 5 February 1985 (Abstract and columns 1-12)	1-16
X	US, A, 4,526,800 (Howard) 2 July 1985 (Abstract and columns 1-16)	1-16
<p>[*] Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search		Date of Mailing of this International Search Report
26 October 1988		15 DEC 1988
International Searching Authority		Signature of Authorized Officer
ISA/US		Ronald W. Griffin

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category*	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
A	US, A, 4,551,347 (Karwowski) 5 November 1985 (Abstract and columns 1-12)	1-16
A	US, A, 4,590,088 (Karwowski) 20 May 1986 (Abstract and columns 1-12)	1-16
A	US, A, 4,624,856 (Vanderveer et al) 25 November 1986 (Abstract and columns 1-22)	1-16

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